CLAIMS

We claim:

1. A substantially purified acetolactate synthase (ALS) enzyme that confers, in a plant, cross-resistance to multiple herbicides.

2. The ALS enzyme of claim 1, wherein the sequence of said ALS enzyme is SEQ ID NO: 1, or a fragment thereof with ALS activity.

3. The ALS enzyme of claim 1, wherein at least two of said multiple herbicides are selected from the group consisting of sulfonylurea, imidazolinone, pyrimidinyloxybenzoate, triazolopyrimidine and sulfonylamino-carbonyl-triazolinone herbicides.

4. A substantially purified ALS gene encoding an ALS enzyme that confers, in a plant, cross-resistance to multiple herbicides.

5. The ALS gene of claim 4, wherein said gene is SEQ ID NO: 2 or a fragment thereof encoding a polypeptide with ALS activity.

6. The ALS gene of claim 4, wherein at least two of said multiple herbicides are selected from the group consisting of sulfonylurea, imidazolinone, pyrimidinyloxybenzoate, triazolopyrimidine and sulfonylamino-carbonyl-triazolinone herbicides.

7. A method of conferring cross-resistance to multiple herbicides to a plant, comprising the step of introducing into said plant an expressible gene encoding an ALS enzyme that exhibits cross-resistance to multiple herbicides, wherein said step of introducing confers cross-resistance to multiple herbicides to said plant.

8. The method of claim 7, wherein said gene is SEQ ID NO: 1, or a fragment thereof that encodes a polypeptide having ALS activity.

9. A transgenic plant that is cross-resistant to multiple herbicides, comprised of a host plant that contains an expressible gene that is not naturally present in said plant, said gene encoding an ALS enzyme that confers cross-resistance to multiple herbicides.

10. The plant of claim 9, wherein said gene is SEQ ID NO:2, or a fragment thereof that encodes a polypeptide having ALS activity.

11. The transgenic plant of claim 9, wherein at least two of said multiple herbicides are selected from the group consisting of sulfonylurea, imidazolinone, pyrimidinyloxybenzoate, triazolopyrimidine and sulfonylamino-carbonyl-triazolinone herbicides.

12. The transgenic plant of claim 9 wherein said plant is selected from the group consisting of *Arabidopsis,* corn, cotton, soybean, rice, wheat, and forage crops.

13. The transgenic plant of claim 9, wherein said ALS enzyme has an aspartic acid to glutamic acid substitution at position six of a conserved sequence GVRFDDRVTGK (SEQ ID NO: 6).